

# *open*EHR & EN13606

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# UPDATE

# National programmes

- *openEHR* providing semantic framework for various national e-health programmes:
  - Sweden
  - Singapore
  - Australia
  - Slovakia
  - Brazil
  - Others coming

# National programmes

- Overall outcomes:
  - Difficulty of problem space massively underestimated
  - Problems and cost of adoption & integration of *de jure* standards massively underestimated
  - Initial reliance on messaging moving towards knowledge based frameworks (archetypes, terminology)
  - Key development space for the future:  
**SERVICES**

# Specifications Progress

- ADL/AOM/TOM 1.5 specification nearly complete and validated; features:
  - Fully defined specialisation
  - Templates are specialised archetypes
  - More precise rules for node identifiers
  - Narrow any constraint, including term lists
  - ‘group’ facility within container attributes
  - Validity rules fully defined
  - See wiki XXXX for details

# *open*EHR / IHTSDO relationship

- Active on both sides
- Will be used to solve 'binding' problem
  - Particularly ref-sets required by clinical and demographic archetypes
- Moving toward integration of archetypes and SNOMED CT
- Merged governance approach likely

# International Archetypes

Currently ~270 archetypes at

<http://www.openehr.org/knowledge>

- Significant work on 'top 10' for ED - these completely model content in most discharge summaries, epSOS etc
- Lab archetypes powerful and growing
- An archetype/template replacement for CCR is now possible (→ multiple 'CCRs')
- ~25 demographic archetypes now in use

Use in national programmes

450 members, 60 countries

# Specifications Progress

- Knowledge governance draft specs
  - Distributed development model
  - Identification specification
- New draft EHR Extract specification, 100% archetypable, already in trial use
- Service specifications are moving ahead

# Specialisation

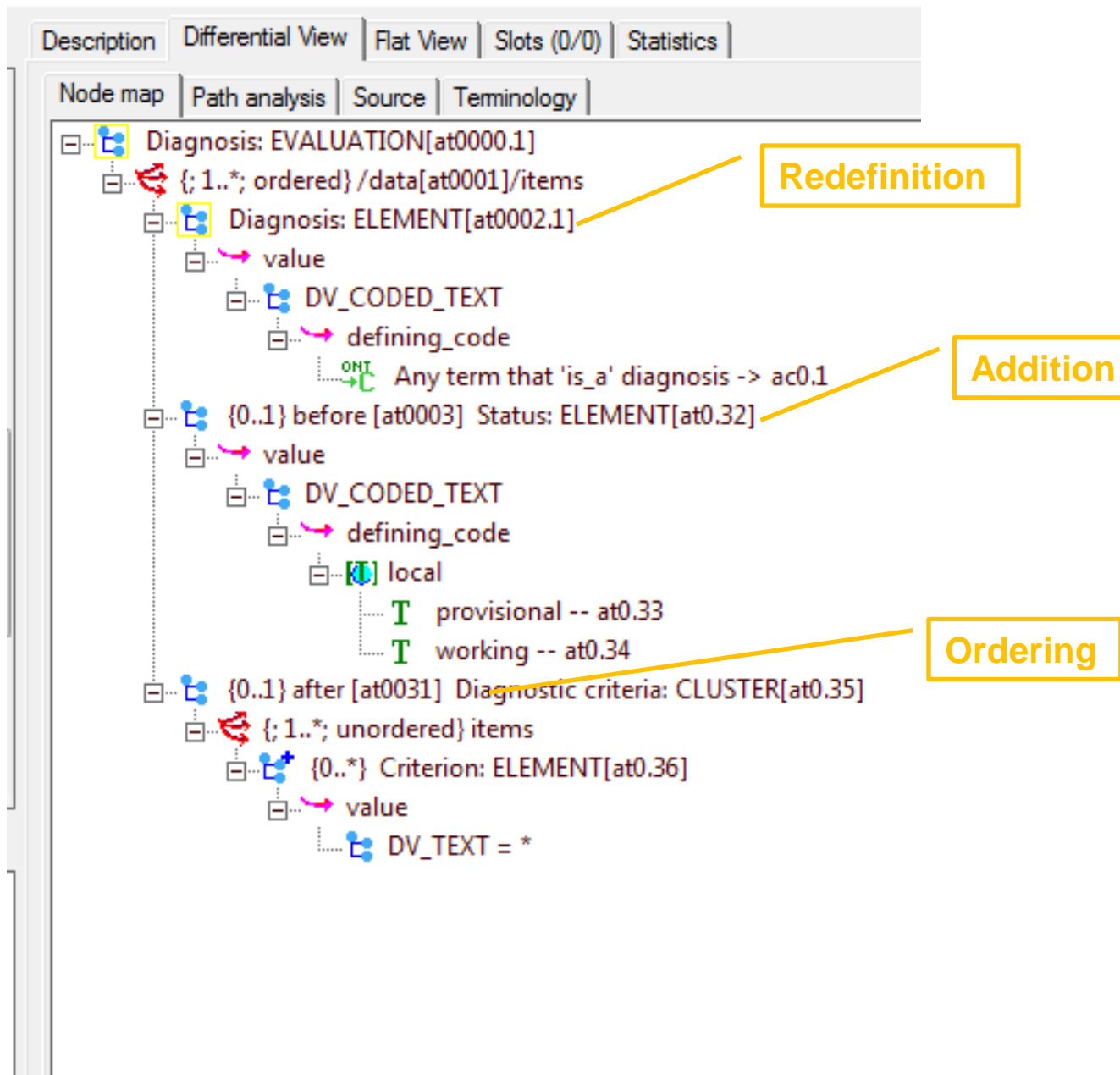
The screenshot displays the openEHR software interface. The top menu bar includes 'Repository', 'History', 'Tools', and 'Help'. Below the menu, there are icons for 'Parse' and 'Edit', and a text field containing 'openEHR-EHR-EVALUATION.problem-diagnosis.v1'. The main interface is divided into several panes:

- Left Pane:** A tree view of resources under the heading 'types - openehr\_rm\_1.0.3'. The resource '(f) problem-diagnosis' is highlighted with a yellow oval.
- Right Pane:** A detailed view of the 'Diagnosis' resource, titled 'Differential View'. It shows a hierarchical structure:
  - Diagnosis
    - /data[at0001]/items
      - Diagnosis
        - value
          - DV\_CODED\_TEXT
            - defining\_code
              - ONT Any term that 'is\_a' diagnosis
    - before [at0003] Status
      - value
        - DV\_CODED\_TEXT
          - defining\_code
            - local
              - provisional
              - working
    - after [at0031] Diagnostic criteria
      - items
        - Criterion
          - value
            - DV\_TEXT = \*

# Specialisation

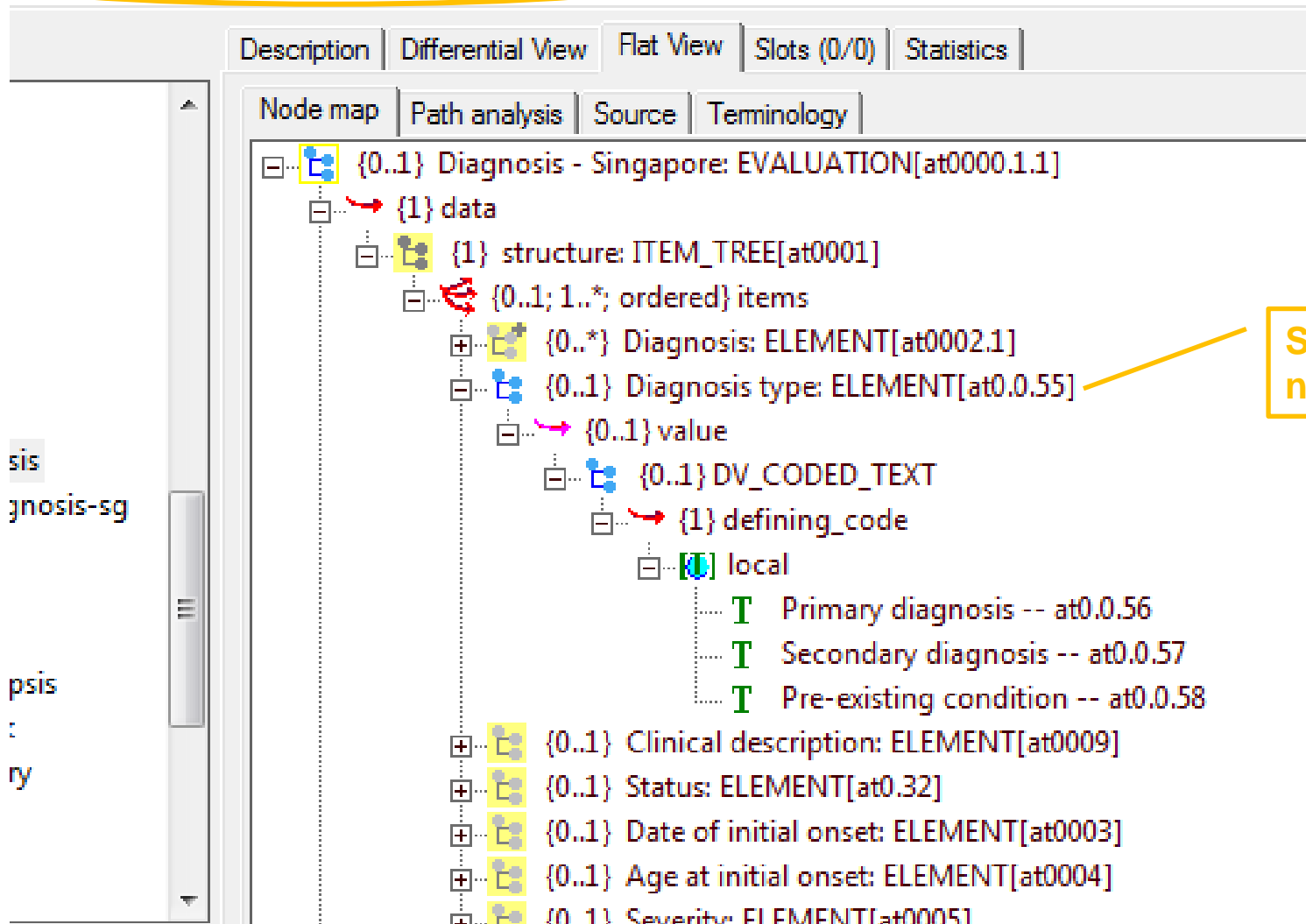
The screenshot displays a software interface for a medical ontology. On the left, a tree view shows the hierarchy of concepts under the identifier 'penehr\_rm\_1.0.3'. The concept '(f) problem-diagnosis' is highlighted with a blue box. Below this, other concepts like 'reason\_for\_encounter', 'risk', and 'section\_summary' are listed. At the bottom, there are counts for 'HIC (5)', 'i (1)', and 'TER (2)'. The main area on the right shows a 'Flat View' of the selected concept. The 'Flat View' tab is circled in yellow. The view shows a hierarchical structure of the concept, starting with 'Diagnosis' and branching into 'data', 'structure', 'items', 'Diagnosis', 'value', 'DV\_CODED\_TEXT', 'defining\_code', 'Clinical description', 'Status', 'value', 'DV\_CODED\_TEXT', 'defining\_code', 'local', 'provisional', and 'working'. The 'defining\_code' for the 'Diagnosis' node is 'Any term that 'is\_a' diagnosis'. The 'local' node has a 'U' icon, and the 'provisional' and 'working' nodes have 'T' icons. The 'Date of initial onset', 'Age at initial onset', 'Severity', 'Clinical significance', 'Date clinically recognised', and 'Age when clinically recognised' nodes are also visible at the bottom of the flat view.

# Semantics



# National specialised archetype

openEHR-EHR-EVALUATION.problem-diagnosis-sg.v1



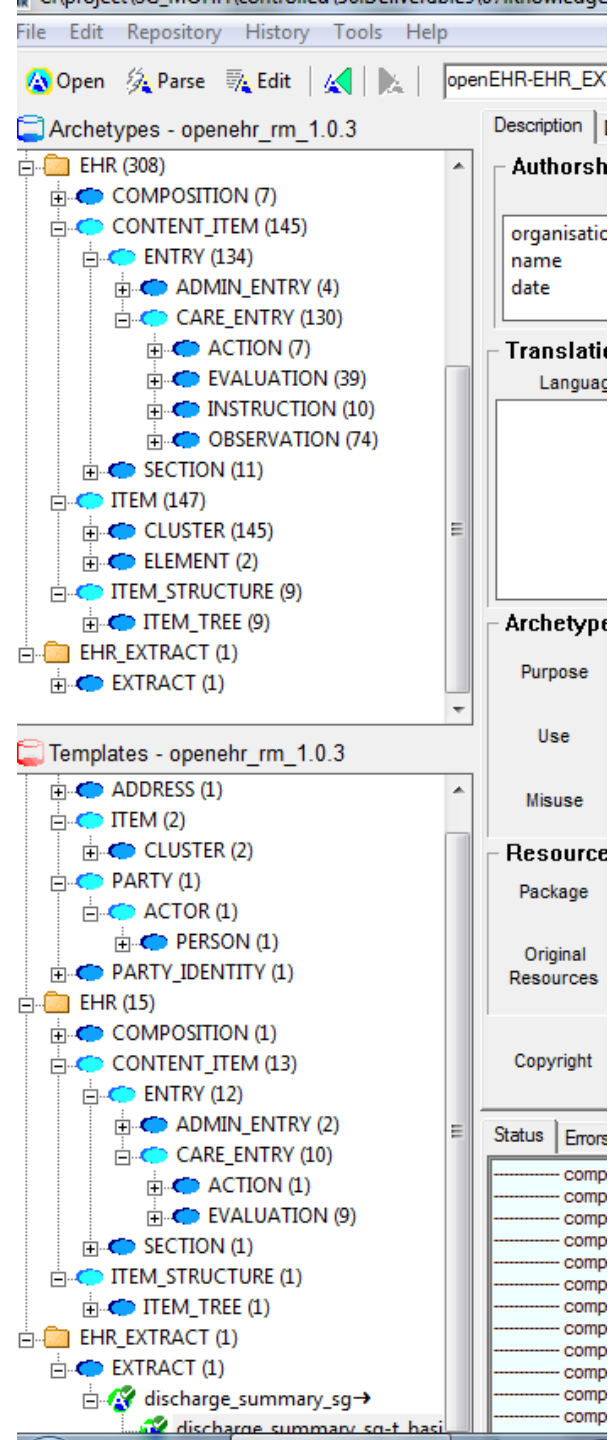
SG Added node

sis  
gnosis-sg  
  
psis  
:  
ry

# Templating

Just a specialised archetype:

- Removals 0..1 → 0..0
- Mandatory 0..1 → 1..1
- Slot-filling
- Slot closing
- Any narrowing
- Node id redefined (aka 'renaming')



# Templating

openEHR-EHR-EVALUATION.problem-diagnosis-sg-t\_problem\_diagnosis ds.v1

Description | Differential View | Flat View | Slots (0/0) | Statistics

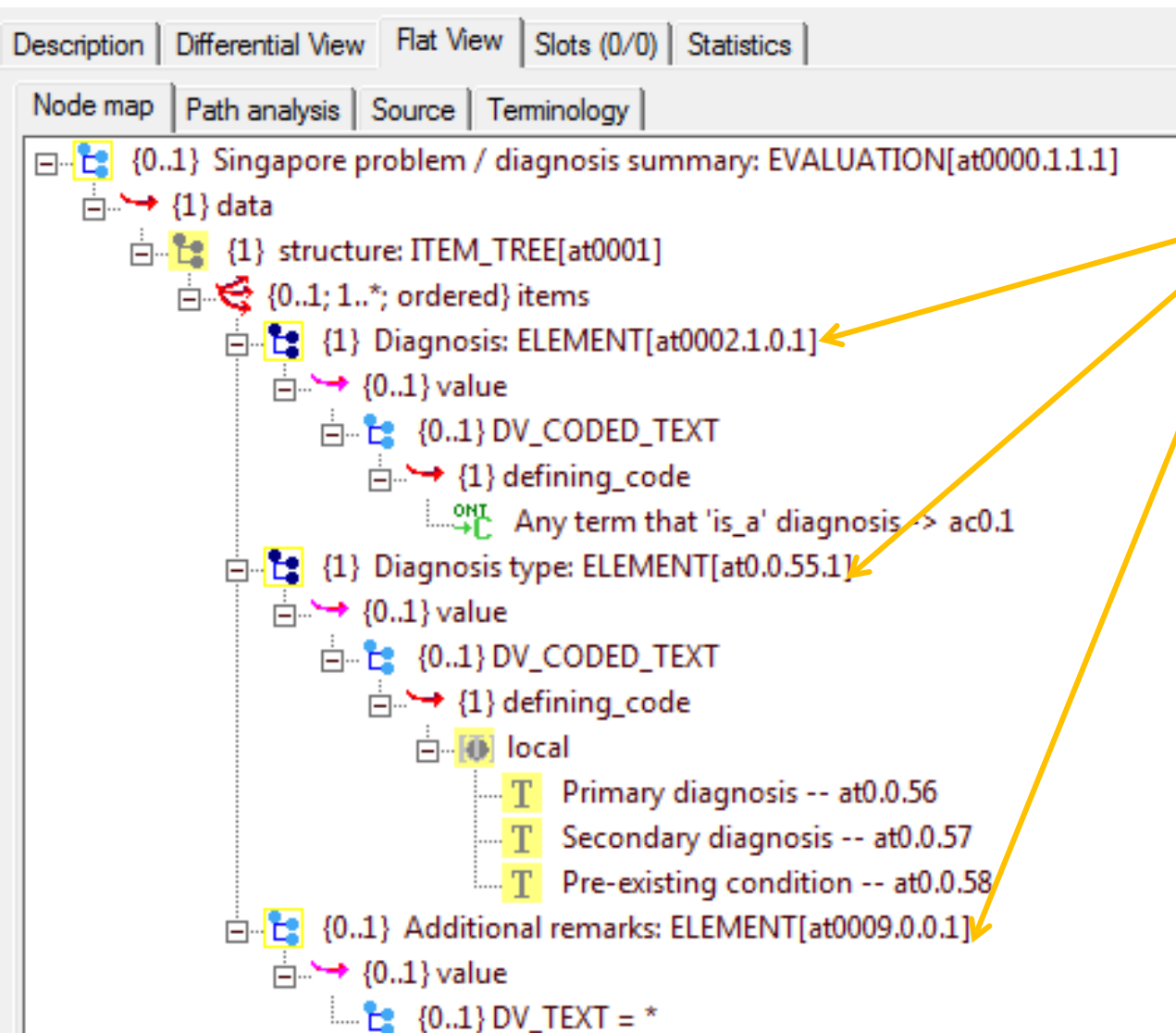
Node map | Path analysis | Source | Terminology

- [-] Singapore problem / diagnosis summary: EVALUATION[at0000.1.1.1]
  - [-] /data[at0001]/items
    - [+] {1} Diagnosis: ELEMENT[at0002.1.0.1] = \*
    - [+] {0} Status: ELEMENT[at0.32]
    - [+] {0} Date of initial onset: ELEMENT[at0003]
    - [+] {0} Age at initial onset: ELEMENT[at0004]
    - [+] {0} Severity: ELEMENT[at0005]
    - [+] Additional remarks: ELEMENT[at0009.0.0.1] - \*
    - [+] {0} Clinical significance: ELEMENT[at0038]
    - [+] {0} Date clinically recognised: ELEMENT[at0010]
    - [+] {0} Age when clinically recognised: ELEMENT[at0037]
    - [+] {0} Location: CLUSTER[at0011]
    - [+] {0} Aetiology: CLUSTER[at0014]
    - [+] {0} Occurrences or exacerbations: CLUSTER[at0018]
    - [+] {0} Related problems: CLUSTER[at0026]
    - [+] {0} Date of resolution: ELEMENT[at0030]
    - [+] {0} Age at resolution: ELEMENT[at0031]
    - [+] {0} Diagnostic criteria: ELEMENT[at0.35]
    - [+] {1} Diagnosis type: ELEMENT[at0.0.55.1] = \*
    - [+] {0} /protocol matches {\*}

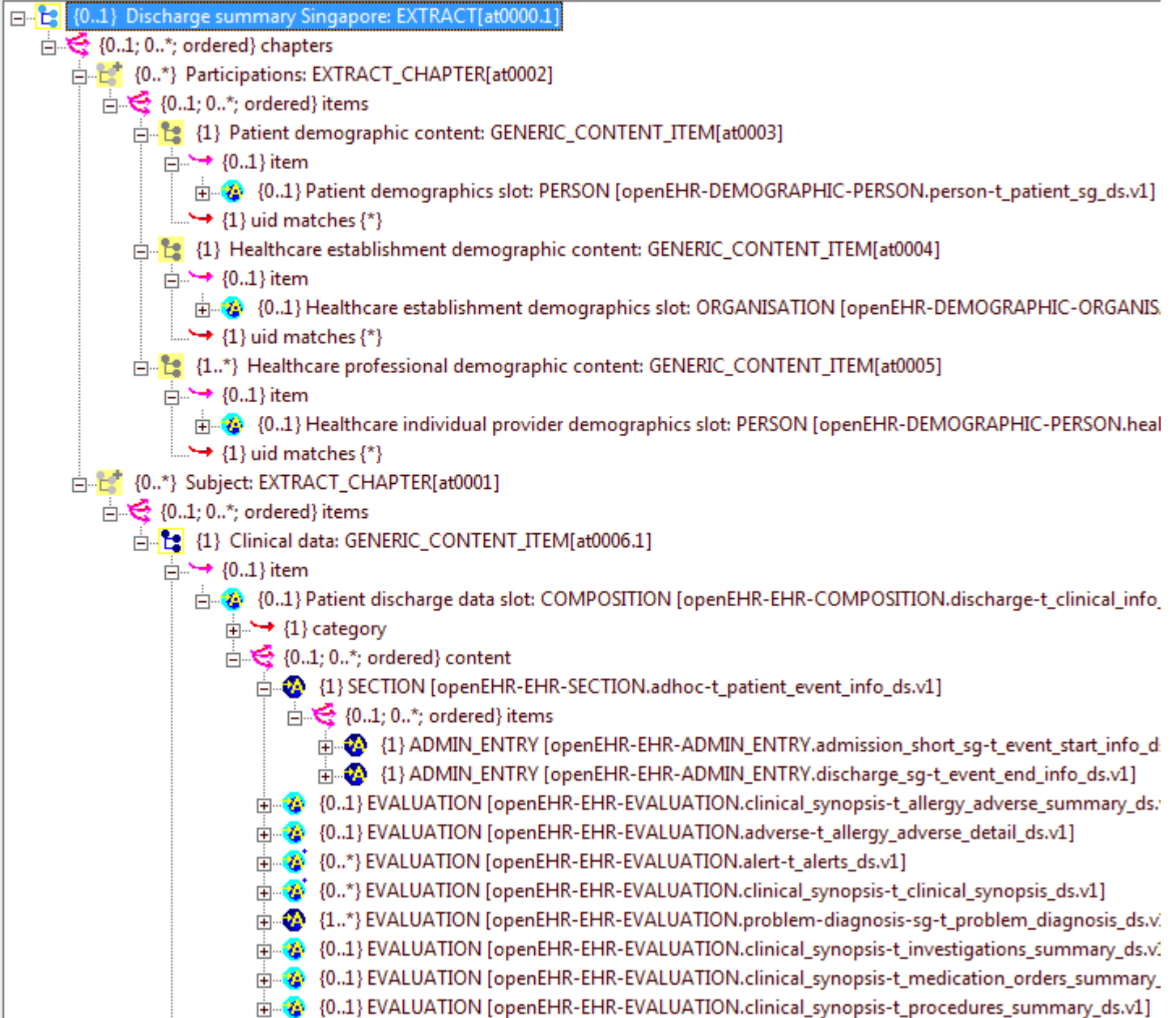
Mandatory

Removals

# Templating – SG Dx template



Only what the customer wants



sis  
gnosis-sg

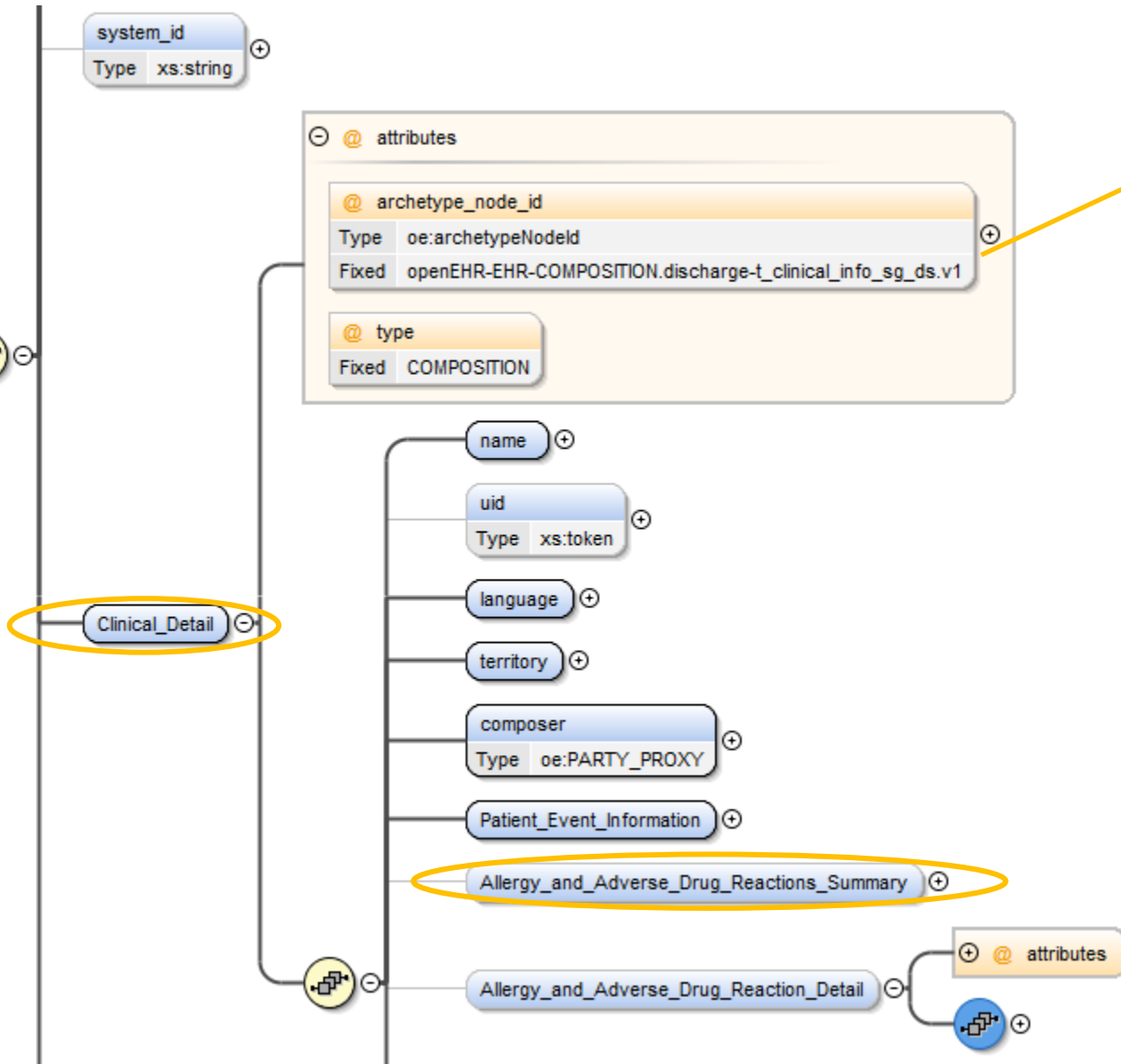
psis  
c  
ry

sis  
gnosis-sg  
ignosis-sg-t

# Guaranteed to work with AQL/a-path

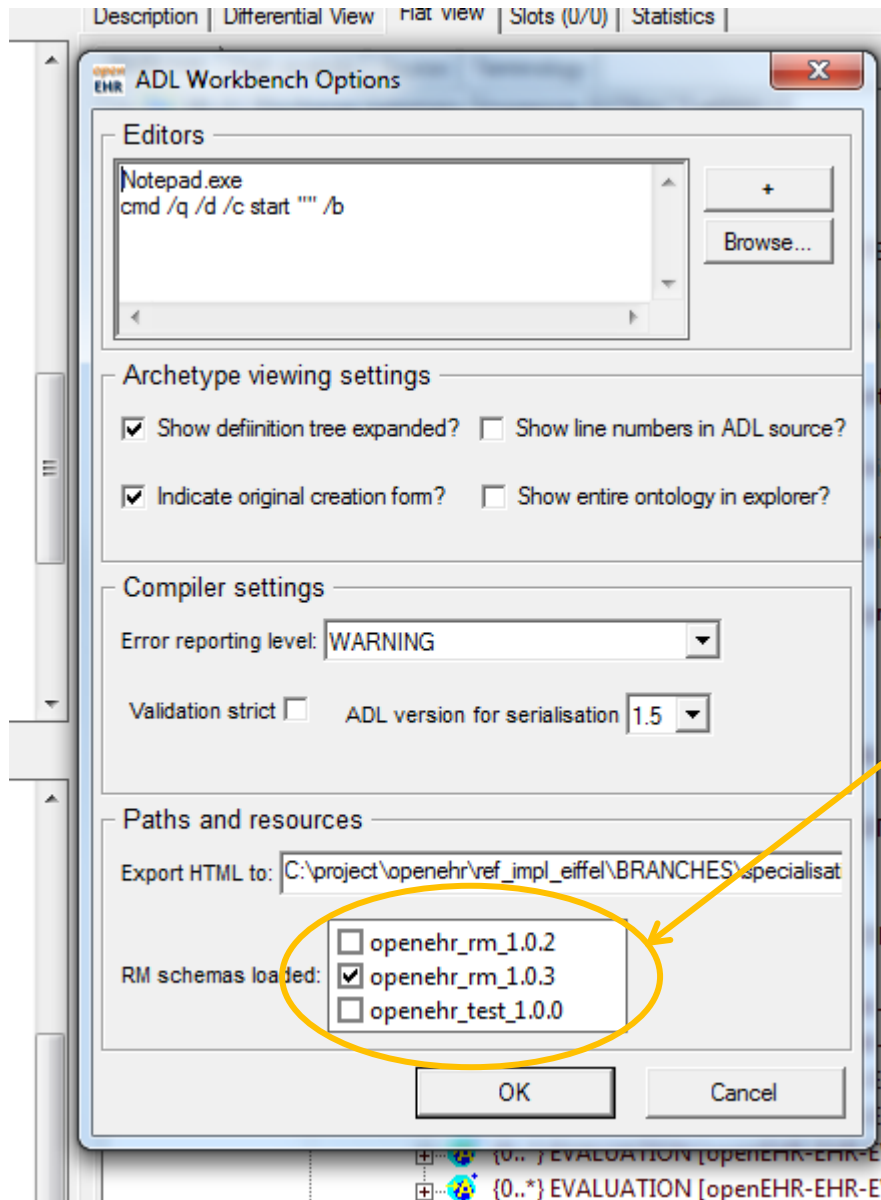
- Paths are always preserved throughout archotyping/templating process
- Node identifiers rigorously specialised
  - e.g. at0001.1, at0.0.55 etc
- Query containing at0001 will pick up at0001.1 - subsumption

# Template → XSD



Embedded archetype / template details

# Model driven tooling



Any model can be added here, including EN13606;

model formalism currently open but not a standard; moving toward Eclipse EMF meta-model

(XSD ~works but doesn't correctly represent inheritance or generics)

# Summary

- ADL/AOM/TOM now an integrated formalism
- Will allow integrated tools for archotyping & templating, including terminology binding
- Querying based on paths and terminology
- More work required on tooling, but national programme support is growing

# Consequences for 13606

- ADL/AOM/TOM 1.5 is a major advance on ADL 1.4 (13606-2)
- Backwardly compatible with ADL 1.4
- ADL Workbench will work for 13606 (needs schema decided)

# STRATEGIC ISSUES

# Industry needs

## Kinds of customer:

- Governments - want a way to standardise:
  - Data sharing → data stds, 'simple' terminology
  - Services → service standards
  - Long term goals: personal health; risk assessment; data reuse for medical research; biosurveillance
    - All need semantic structure, coding, querying
- Healthcare providers
  - Production information users
- Secondary use
- Pharmaceutical companies

# Industry projection – 3-5 y

- Simple content sharing
- Location services
- Security & privacy



X-enterprise  
services

## JUST SIMPLE STUFF...

## But Integrated, please!

- demographics, ehr
- basic structuring
- model driven
- data mgt apps
- discharge summary
- medications
- problems

Information

Terminology

- local terminologies
- basic interoperability
- Simple subsets / refsets
- Simple inferencing



openEHR

# Industry projection – 5-10 y

- Distributed querying
- Distributed consent
- Care pathways

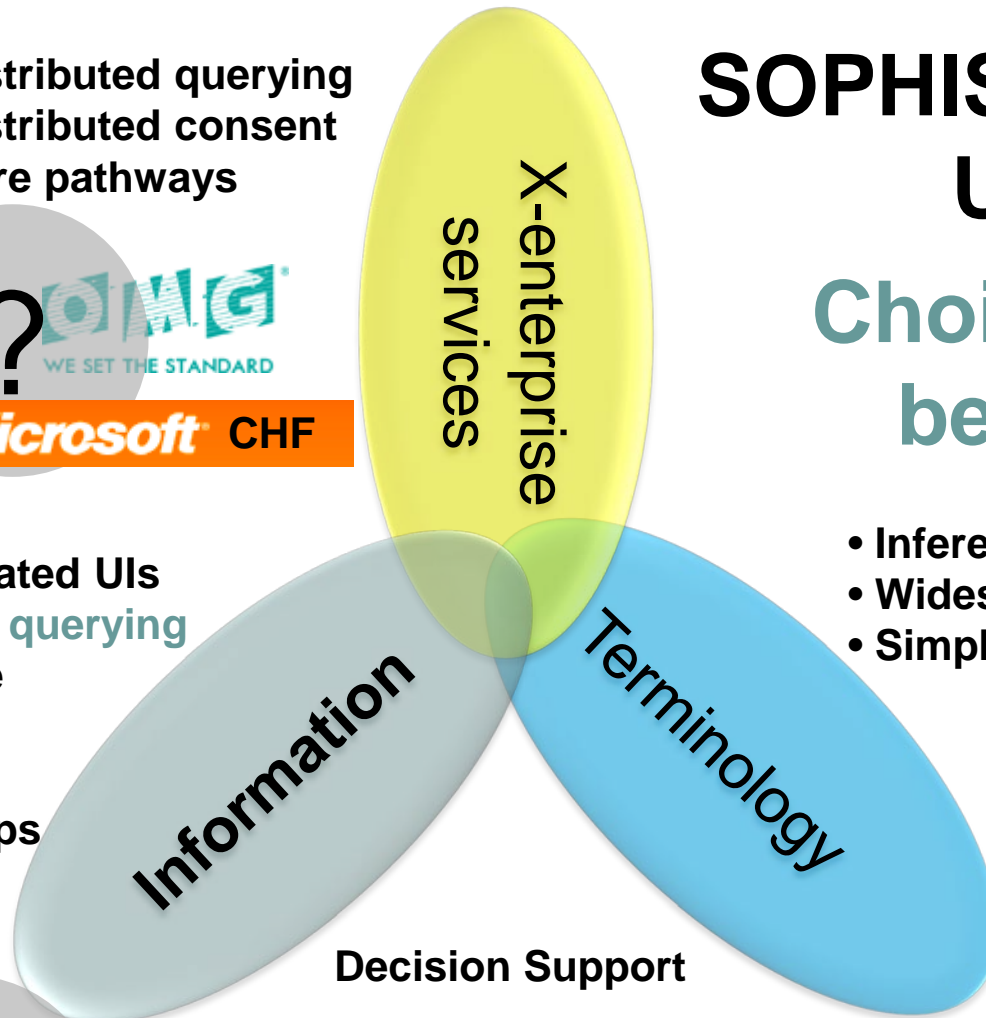


## SOPHISTICATED USE

Choices will be made

- Model-generated UIs
- Fine-grained querying
- Model re-use
- Performance and volume
- Business apps

- Inferencing
- Widespread ref sets
- Simple post-coordination



# Industry will not accept this

- In the long term, it is clear that the overall number and diversity of standards is unacceptable to industry... Evidence:
  - IHE and HITSP have become the main means of integrating & deploying the mess
  - But they have almost no semantic framework
  - IHTSDO is gaining significant support (19 members)
- There will be a consolidation

# Who wins...

Is who integrates....i.e. who provides a platform and takes away the standards pain...

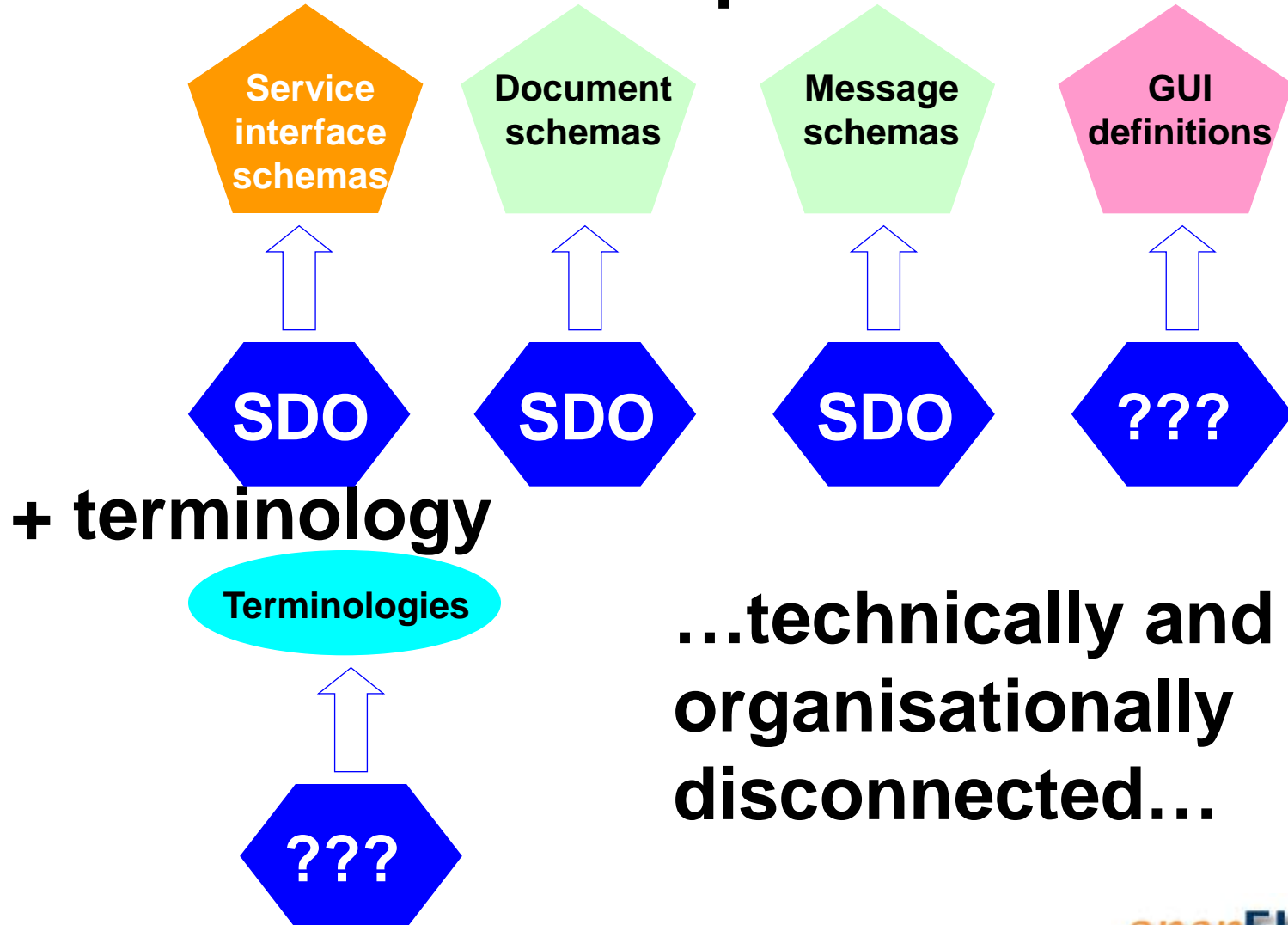
The health computing platform =

- Services
- Information models / standards
- Integrated terminology
- Knowledge modelling framework

A coherent architecture is needed

# What we have today

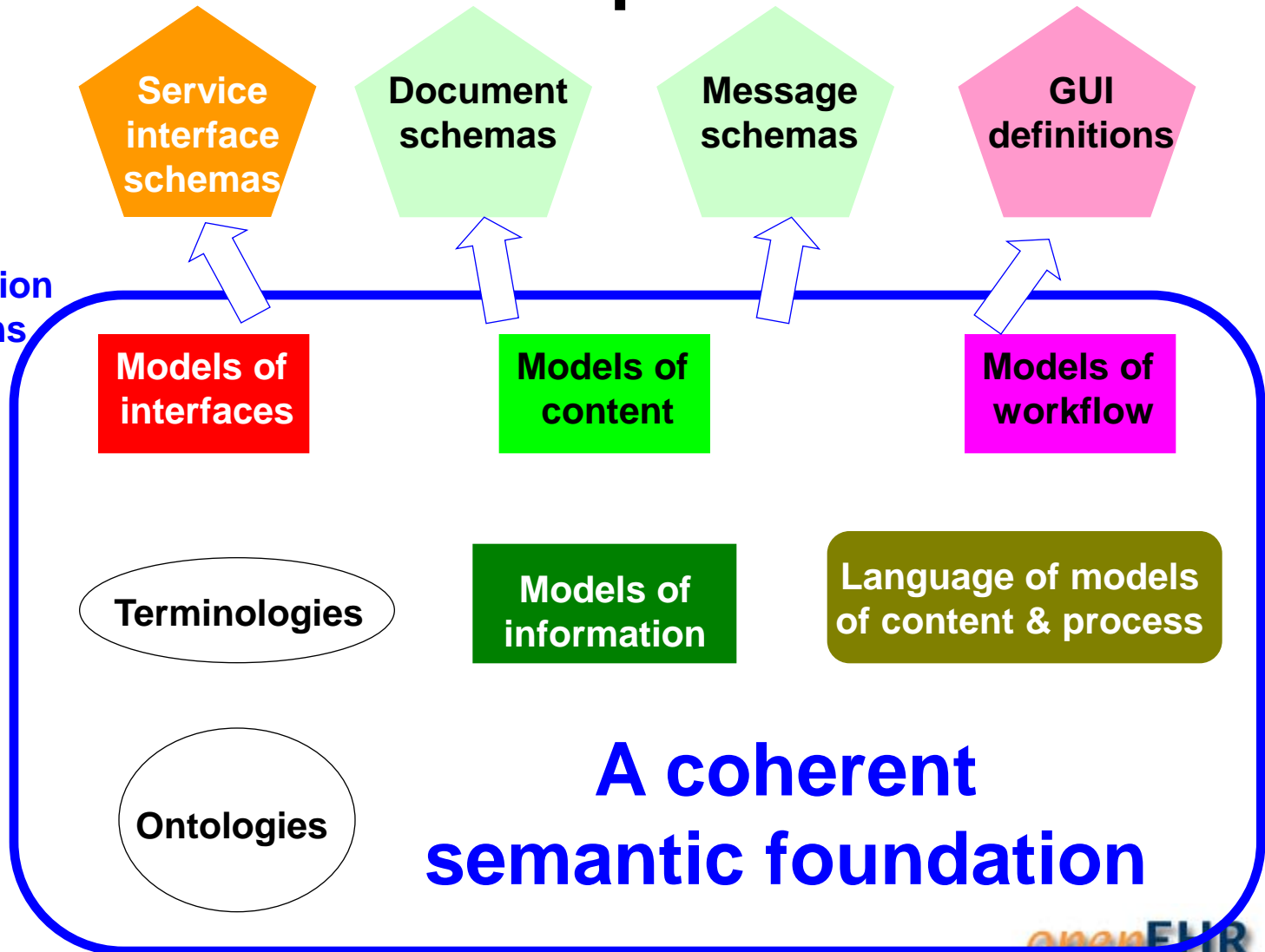
## Standards for particular media



# What we need...

## Standards for particular media

Generation  
of concrete  
implementation  
specifications



# What standards / SDOs do provide

- Acceptability to governments
- Lowest common denominator (aka best possible agreement) across wide jurisdiction for particular use case(s)
- Stability

# What standards / SDOs don't provide

- A development community
- A maintenance plan or mechanism
- Agility – ability to respond quickly
- Access to innovation
- A good starting point for building a software architecture (they are specifications for moving data point to point)

# A '13606 community?'

- Limited to one standard? (of which part 2 already managed by *openEHR*)
- Communities are for building components, systems – which normally use > 1 standard
- Involves creation of a whole infrastructure of people, mailing lists, websites, wikis, issue trackers
- ....but still stuck with the slowness of CEN/ISO management
- Replicates infrastructure available elsewhere

# Existential Question

Should the 'community' be built around the 13606 standard?

.... Or a semantic framework that treats the standard as one integration target?

Should work on EN13606 be done in a separate 'association'?

☹ this is exactly the opposite of what national e-health programmes want – yet another standards org to deal with!

# Looking ahead

A joined openEHR/13606 community:

- 13606-specific mailing list(s)
- 13606-specific software projects
- Take advantage of Jira, Confluence etc
- Use & help build *openEHR* archetype tooling
- Connect to *openEHR/IHTSDO* joint development
- Help develop next generation EHR Extract

Become the apache.org of e-health